

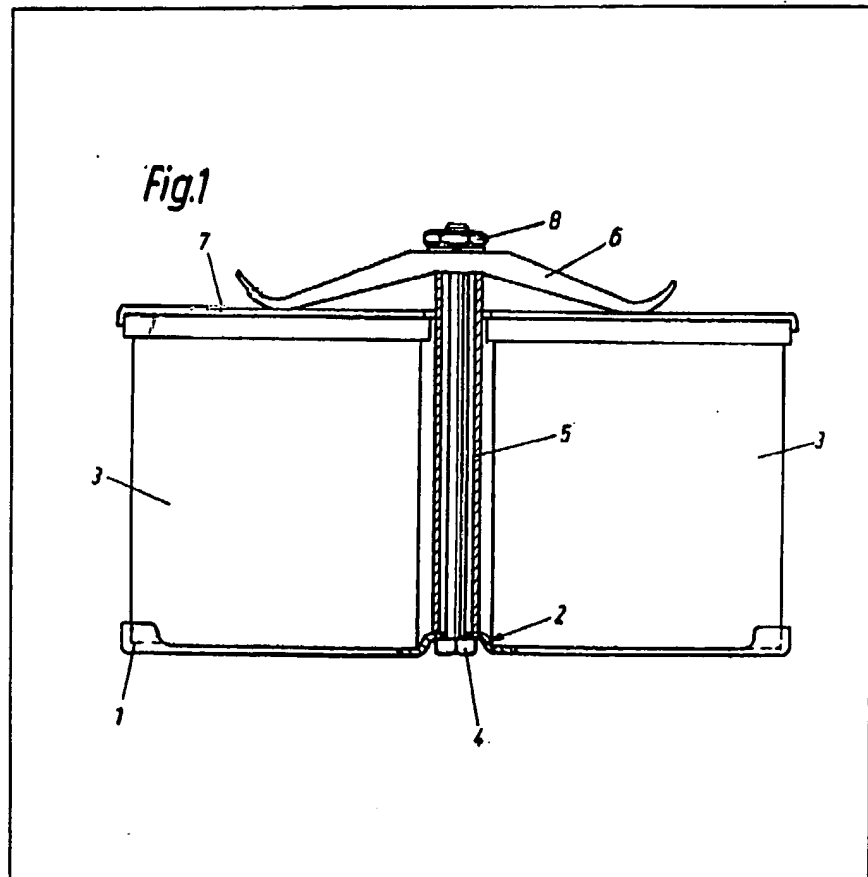
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(54) An arrangement for securing a battery in a vehicle

(57) An arrangement for securing at least one vehicle battery comprises a frame for stably accommodating the battery and at least one tie member for acting on the battery by way of an intermediate member extending over

the top of the battery and pressing it onto the frame. The intermediate member comprises a leaf spring 6 and means is provided for limiting the length of adjustment, for clamping the battery, of the tie member. The latter may be a tie rod 4 and the means for limiting the adjustment length a distance sleeve 5.



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Fig.1

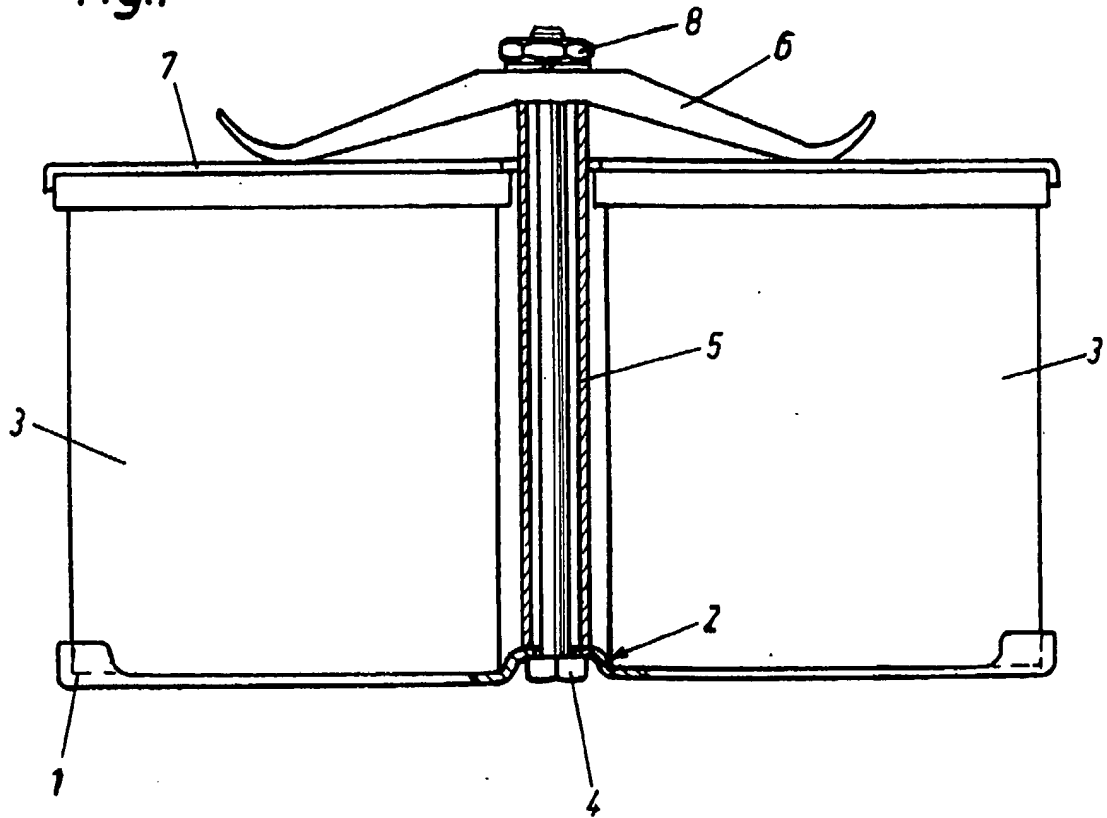
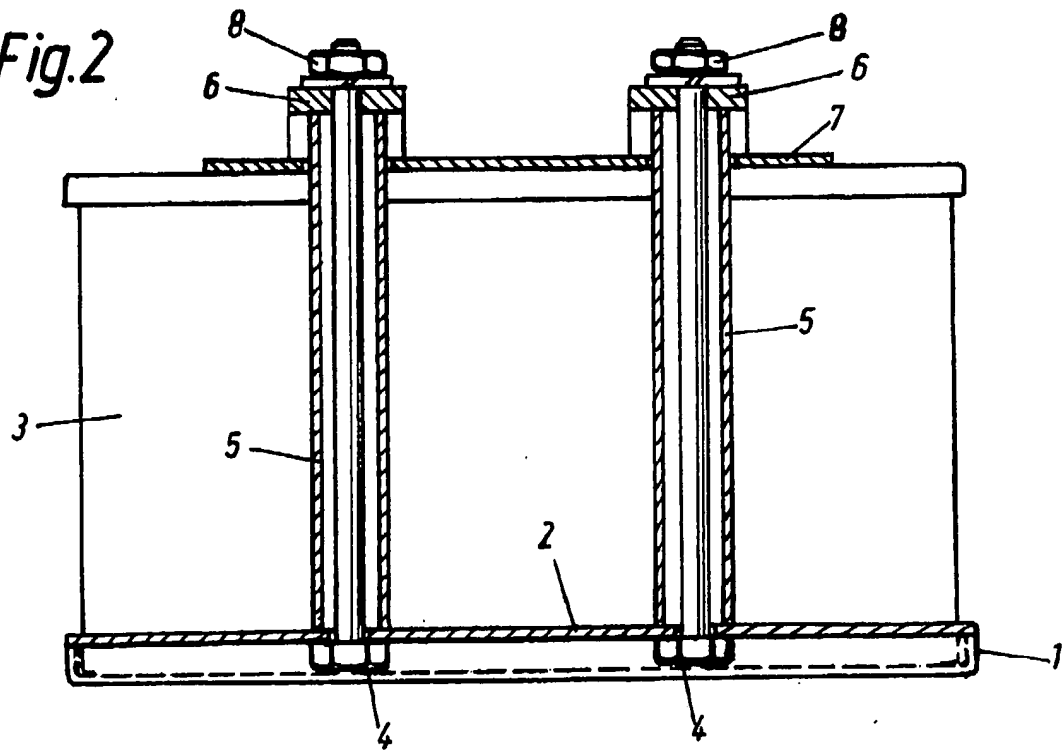


Fig.2



SPECIFICATION

An arrangement for securing a battery in a vehicle

5 The invention relates to an arrangement for mounting and securing at least one battery or accumulator in a vehicle, comprising a supporting frame for stably accommodating a battery and at least one tie member for acting on the battery in conjunction with an intermediate member for extending over the top of the battery and pressing it onto the frame.

10 An arrangement for securing batteries disclosed in German Patent Specification 824 443 comprises a supporting plate which carries 15 four angle-shaped buffers of foam rubber, one arm of each buffer extending in the direction of a side wall of the battery casing. The plate is provided with two opposite lugs into which a U-shaped clamping band, passing over the battery cover and also provided with two rubber buffers, is engaged 20 after the buffers have been loaded and compressed. This arrangement has the disadvantage that the resilience of the foam buffers diminishes considerably with ageing, so that reliable holding of the battery is no longer ensured after a long 25 period of use.

30 In an arrangement for securing battery boxes disclosed in German Patent Specification 1 163 410, an elastically deformable resilient element of soft rubber is provided in each retaining stirrup clamping the battery against a base. In this case also, there is no provision in the stirrups for subsequent length adjustment, so that the battery box may become loose or separated from the base 35 with ageing and decrease of elasticity of the rubber elements.

40 An arrangement for securing batteries, particularly in agricultural tractors, disclosed in German Specification 930 731 comprises a base frame provided with a foam-rubber plate. The battery is placed on this plate and is surmounted by a frame member resting at the corners, which also has foam-rubber insets. This frame member is clamped to the base frame by a tension spring on 45 each side. Difficulties may arise from variations of temperature in use causing variations in the external dimensions of the battery casing and reliable mounting may be impaired with ageing of the rubber plate. Moreover, if hard tension springs are used, permanent deformations and cracks in 50 the casing walls are liable to result from clamping-force peaks due to variations of height of the casing.

55 The invention seeks to provide an arrangement which, whilst taking into account installation tolerances and settling or setting of the battery casing, for instance of polypropylene, caused by the forces arising and at different temperatures in use, a predetermined clamping force or tension will hold the battery against the supporting frame without risk of its becoming unintentionally loose or detached or of excessive clamping force being 60 exerted by the securing means acting on the battery.

65 According to the invention, in an arrangement

70 for securing at least one battery in a vehicle comprising a support frame for stably accommodating the battery and at least one tie member for acting on the battery in conjunction with an intermediate member for extending over the top of the battery and pressing it onto the frame, the said intermediate member comprises a leaf spring and means is provided for limiting the length of adjustment, for clamping the battery, of 75 the tie member.

80 Suitably, the tie member is a tie rod and the said means for limiting the length of adjustment thereof is a distance sleeve. However, the limiting means may take other forms, such as a shoulder on the tie rod.

85 With an arrangement in accordance with the invention the clamping force of the leaf spring on the battery can be made to remain substantially constant irrespective of dimensional variation tending to affect the clamping and caused by differences in temperature in use or by settling of the battery casing. The battery will not become loose or detached even under vigorous vibrations. The damping effect of the leaf spring will reduce 90 or take up vibrations as well as compensating for dimensional variations which might effect the clamping. The clamping pressure on the battery will be maintained substantially constant by the predetermined clamping length.

95 One embodiment of the invention will now be more fully described, by way of example, with reference to the accompanying drawing, in which:

100 Fig. 1 is a front elevation of an arrangement in accordance with the invention for mounting and securing two motor-vehicle batteries side by side, and

Fig. 2 is a side elevation thereof, partially in vertical section.

105 The arrangement illustrated comprises a supporting frame 1 subdivided by a longitudinal rib 2 into two parts which are each dimensioned to accommodate one battery 3. At least one screw-threaded tie rod 4 is disposed with its head in the recess formed by rib 2. As shown in Fig. 2, there are two spaced such rods 4 in the embodiment 110 illustrated. A distance sleeve 5 forms a stop for a transverse clamping member in the form of a leaf spring 6 bearing on both batteries 3. As illustrated a cover frame 7, preferably, a single frame 115 extending over the two batteries 3, may be interposed between the spring or springs 6 and the batteries 3, so that the clamping force exerted by the spring 6 on the battery tops is distributed over a larger area and possible abrasion at the surface of spring contact is avoided. By tightening the nut 8 on the or each tie rod 4, the leaf spring 6 is held against the stop or distance sleeve 5, so that a definite effective clamping length is 120 predetermined and the clamping force on the two batteries 3 attains a predetermined value which remains substantially constant as long as the batteries are left in the clamped condition. Due to the good damping properties of the leaf springs 6, vibrations and oscillations transmitted to the 125 batteries 3 are quickly dissipated.

Instead of the stop arrangement illustrated, use may be made of a stop shoulder provided on the rod 4 or on the sleeve 5.

5 The mounting and securing arrangement may be similarly applied to a single battery 3. If a two-armed leaf spring 6 is employed, the other arm of the spring, not bearing upon the battery, may bear upon a fixed abutment surface.

10 In some cases, the leaf spring, instead of bearing upon the or each battery with direct pressure, may be arranged to exert clamping pressure by means of a claw-like action on the top of the or each battery.

15 Applied to more than two batteries, more than two leaf springs or a leaf spring of spider form may be employed.

CLAIMS

20 1. An arrangement for securing at least one battery in a vehicle comprising a supporting frame for stably accommodating the battery and at least

one tie member for acting on the battery in conjunction with an intermediate member for extending over the top of the battery and pressing it onto the frame, wherein the said intermediate member comprises a leaf spring and means is provided for limiting the length of adjustment, for clamping the battery, of the tie member.

25 2. An arrangement according to claim 1, wherein the tie member is a tie rod and the said means for limiting the length of adjustment thereof is a distance sleeve.

30 3. An arrangement according to claim 1 or 2 for two batteries disposed side by side, wherein the leaf spring is engaged by the tie member at an intermediate point in its length and is engageable with the batteries by respective end portions.

35 4. An arrangement for securing a battery substantially as hereinbefore described with reference to the accompanying drawing.